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ON A NEW SPECIES OF *PENAEUS* (CRUSTACEA, DECAPODA :
PENAEIDAE) FROM NORTH BORNEO*

With 1 Table and 2 Text-figures

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北ボルネオ産クルマエビ属エビの1新種について

表1, 挿図2

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Abstract: A new species of penaeid prawn, *Penaeus silasi* from North Borneo is described in detail and compared with the closely related species such as *P. indicus*, *P. merguensis* and *P. penicillatus*. The new species is characterized by the following features: The 3rd maxilliped of the adult male has a dactylus as long as or slightly shorter than the propodus which has only a rudimentary tuft of hair instead of a long tuft of bristles as in *P. indicus*; the anterior plate of the thelycum is triangular and relatively prominent.

Introduction

In the courses of examination of a sample of penaeid prawns collected by one of authors (H. M.) from Sabah, North Borneo, a species of *Penaeus* closely resembling *Penaeus merguensis* but showing clear cut differences from it was discovered. The species is named *Penaeus silasi* in honour of the dynamic Director of Central Marine Fisheries Research Institute, Cochin, India. It is described in detail in this paper and

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compared with the closely related species *P. indicus*, *P. merguensis* and *P. penicillatus*.

Penaeus silasi sp. nov.

Penaeus indicus KUBO, 1949, pp. 311-313., HALL, 1956, p. 75., 1962, p. 16.

Material: Tawau, Sabah, 27th Feb. 1977, 36 m, muddy bottom, holotype male 139 mm total length (30.7 mm carapace length), allotype female 178 mm T.L. (41.1 mm C.L.), Paratypes, seven males 124-140 mm T.L. (25.0-30.1 mm C.L.) and three females 141-200 mm T.L. (31.0-47.6 mm C.L.); Sandakan, Sabah, 2nd March 1977, seven males 134-153 mm T.L. (27.5-32.8 mm C.L.), and three females 163-175 mm T.L. (36.3-39.5 mm C.L.), Kuching, Sarawak, one male 125 mm T.L. (25.5 mm C.L.) and three females 130-158 mm T.L. (27.9-33.9 mm C.L.).

The holotype and allotype are deposited in the Biology Laboratory of the Aquaculture Department of the Southeast Asian Fisheries Development Center, (SEAFDEC), Tigbauan, Fpilippines. (Reg. No. 1979. p. 3-4).

Diagnosis: Large, commercially important white prawn, very similar in external appearance to *Penaeus merquiensis*: 3rd maxilliped of adult male with the dactylus as long as or slightly shorter than propodus, dactylus narrower than propodus which has only a small conical tuft of hairs instead of the long pencil of bristles; anterior plate of thelycum triangular with rounded apex.

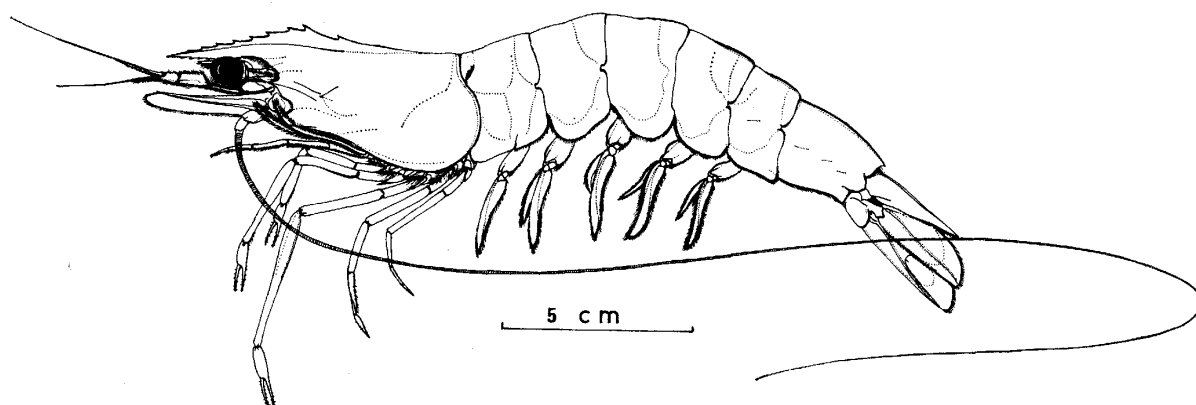
Description

Rostrum almost straight, reaching or slightly exceeding tip of antennular peduncle, sometimes reaching only tip of second segment, with low rostral crest in males and higher crest in large females almost approaching the condition in *P. merquiensis*. Rostral teeth 1+6-8/4-5. Postrostral carina extending to posterior 1/8 of carapace, with 2 or 3 short sulci or pits. Adrostral carina and sulcus reaching just behind epigastric.

Carapace glabrous. Gastrorbital carina well defined occupying posterior 2/3 of distance between hepatic spine and the postorbital margin; hepatic carina absent; antennal carina ending in front of hepatic spine.

Antennular peduncle falls short of tip of scaphocerite reaching only end of distrolateral spine of scaphocerite. Outer flagellum almost as long as carapace, and roughly twice length of inner flagellum. Prosartema exceeding tip of eye, stylocerite barely reaching 1/2 basal segment.

Third maxilliped extending to middle of 2nd segment of peduncle in females and 3/4 2nd segment in males, dactyl in adult males as long as or slightly shorter than propodus which has only a rudimentary tuft of apical setae, width of dactyl narrower than propodus, dorsal groove on dactyl shallow. First pereopod exceeding carapocerite



Text-fig. 1. Lateral view of female *Penaeus silasi* C.L. 47.6 mm.

by 1/2 palm, 2nd reaching 3/4 middle segment in males and tip of peduncle in large females, 3rd exceeding scaphocerite by finger or distal 2/3 of palm, 4th exceeding carpocerite by 1/2 dactyl and 5th exceeding carpocerite by entire dactyl. Ischial spine present on first pereopod.

Abdomen dorsally carinated from posterior 2/3 of 4th segment; fifth segment with one and 6th with 3 small lateral cicatrices. Telson unarmed, as long as 6th abdominal segment.

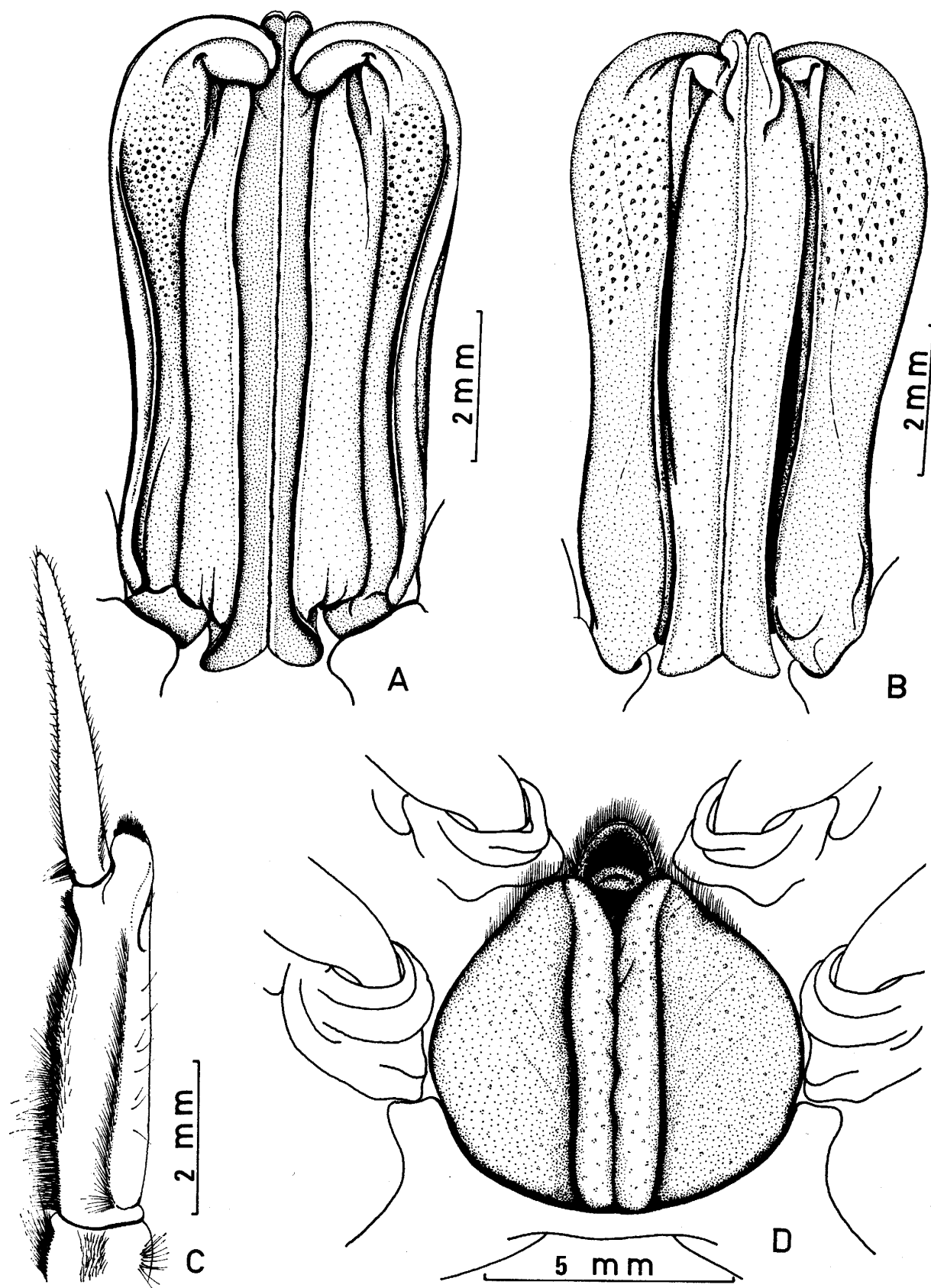
Petasma (Text-fig. 2, A·B) with median distal projections not overhanging lateral lobes when seen from side. Distal margin of lateral lobe minutely serrate, outer surface of lateral lobe with a patch of minute conical teeth.

Thelycum (Text-fig. 2, D) with anterior plate triangular, apex rounded, more prominent than in *P. indicus* and *P. merguensis*. A row of hair fringes the anterior border of the plate. The posterior median fleshy projection, which is enclosed by the tumid lips of the seminal receptacles, originates posterior to the base line of the triangular anterior plate and not from the middle of the plate as in *P. merquiensis*.

Distribution: The present material is from Sandakan and Tawau in Sabah and from Kuching in Sarawak. The specimens referred to *P. indicus* by KUBO (1949) and HALL (1962) from Bangkok and Singapore respectively appear to belong to this species (vide infra). It appears that the new species is widely distributed in the South China Sea region.

Discussion

KUBO (1949), who identified two male specimens from Bangkok as *Penaeus indicus*, noted that the propodus of the 3rd maxilliped had only a rudimentary tuft of apical setae but considered the specimens as abnormal. The Singapore specimens identified by HALL (1962) as *P. indicus* also lack the prominent tuft of apical setae on the propodus of the 3rd maxilliped of male. Following KUBO (1949), HALL (1962) also



considered this condition as an abnormal variation. However, the present authors after examining 15 males from three different places in North Borneo, (Kuching, Sandakan, and Tawau) and comparing them with specimens of *P. indicus* and *P. merguiensis* collected from Sandakan and Tawau, have no hesitation in stating that the peculiar condition of the 3rd maxilliped noted by KUBO and HALL is characteristic of the new species of *Penaeus* described here and is in no way abnormal. Further the excellent illustrations of the 3rd maxilliped (fig. 117, i) and petasma (fig. 24, w-z) given by KUBO (1949) and the illustrations of the entire animal (fig. 86), petasma (fig. 86a) and thelycum (fig. 86b) given by HALL (1962) clearly show that the specimens identified by these two authors as *P. indicus*, are in fact identical with the new species described here.

Penaeus silasi belongs to the sub-genus *Fenneropenaeus* of Perez FARFANTÉ (1969). The other species in this sub-genus are *Penaeus indicus*, *P. merguiensis*, *P. penicillatus* and *P. orientalis*. The last mentioned species is restricted to the temperate regions of Japan and Korea and is peculiar in having a three segmented maxillulary palp. Among the tropical species, *P. silasi* is closer to *P. merguiensis* than to the other two species in the structure of the thelycum and petasma and general body shape. But in the carination of the carapace and the structure of the 3rd maxilliped, it is closer to *P. indicus*. However, the rudimentary tuft of apical setae on the propodus of the 3rd maxilliped of the male and the triangular shape of the anterior plate of the thelycum are characteristic of *P. silasi*. The new species is also peculiar in that the length of the 3rd maxilliped is more or less the same in both males and females, never reaching beyond the tip of the 2nd antennular segment. In all the other species of the group, the 3rd maxilliped of the adult males is longer, extending just beyond the antennular peduncle, while in the females it reaches only the middle of the 2nd segment. Concomitant with the absence of the long pencil of setae at the tip of the propodus, the dactylus of the 3rd maxilliped of the males in *P. silasi* is not as deeply grooved on the dorsal side as in the other closely related species of *Penaeus*, where the deep groove on the dorsal surface of the dactylus accommodates the pencil of setae from the propodus. In *P. silasi* the ratio of dactylus length to propodus length in the 3rd maxilliped of males is more or less similar to the ratio obtaining in *P. indicus* (i.e. 1:1); but the length of the dactylus expressed as a percentage of the carapace length shows a clear cut difference between the two species; the dactylus is 12-18% of the carapace in *P. silasi* and 21-26% in *P. indicus*.

Text-fig. 2. A and B, ventral and dorsal views of petasma of *Penaeus silasi* C.L. 30.1 mm.; C, dactylus and propodus of third maxilliped of same male; D, thelycum of female C.L. 47.6 mm.

The new species is compared with *P. indicus*, *P. merguiensis* and *P. penicillatus* in the following table.

Characters	<i>Sp. nov.</i>	<i>P. indicus</i>	<i>P. merguiensis</i>	<i>P. penicillatus</i>
Rostrum	Almost straight, as long as antennal peduncle in adults postral crest low.	Sigmoid, distinctly longer than antennular peduncle even in adults. Rostral crest absent.	Almost straight as long as peduncle in adults. Rostral crest high and triangular.	Almost straight as long as peduncle in adults. Rostral crest high and triangular.
Adrostral carina	Reaching behind epigastric tooth.	Reaching epigastric tooth.	Ends before epigastric.	Ends before epigastric.
Gastro-orbital carina	Prominent, occupying posterior 2/3 of space between hepatic spine and orbital margin.	Prominent, occupying posterior 2/3 of space in front of hepatic spine.	Faint, occupying middle 1/3 of space or absent altogether.	Faint, occupying middle 1/3 of space in front of hepatic spine.
Dactylus of 3rd maxilliped in adult males	As long as propodus or slightly shorter; narrower than width of propodus; dorsal groove shallow.	As long as propodus or slightly longer; as wide as propodus; deeply grooved dorsally.	1/3 as long as propodus; as wide as propodus; deeply grooved dorsally.	1½-2 times longer than propodus; as wide as propodus; deeply grooved dorsally.
Propodus of 3rd maxilliped of adult males	With rudimentary tuft of hair.	Long pencil of setae as long as dactylus	Long pencil of setae well developed, slightly shorter than dactylus.	Long pencil of setae as long as dactylus.
Anterior plate of thelycum	Triangular and prominent; fleshy convex prominence originates posterior to base of triangle.	Almost hidden by anterior extension of lateral plates.	Semicircular; fleshy convex prominence originating in the middle of anterior plate.	Semicircular; fleshy convex, prominence originating in the middle of anterior plate.
Lips of the seminal receptacle	Normal.	Very prominent and corrugated with numerous ridges on median aspect.	Normal	Normal

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要 約

1977年2, 3月, 北ボルネオ (マレーシア領) の Tawau, Sandakan および Kuchin 沖で底曳き網により採集されたクルマエビ属 (*Penaeus*) のエビを後日, 分類中, 26個体 (雄16, 雌10) の見慣れない, 比較的大型 (全長 124~200 mm) のエビを見出した。それらは一見 *P. merguiensis* や *P. indicus* に似ているが, 精査するといくつかの相異点がみられ, それらは既存の種の記載に合致せず, 新らしい種と認められた。新種の特徴は次のとおりである。

額角は直線的で, antennular peduncle のほぼ先端に達し, 上縁に7~8棘 (胃上棘も含む), 下縁に4~5棘を備える。Rostral crest は低い。Adrostral carina (額角側峰) は epigastric spine (胃棘上) の後に達する。Gastro-orbital carina (眼胃峰) はよく発達し, hepatic-spine (肝棘) と postorbital margin 間の約2/3を占める。Hepatic carina (肝峰) を欠く。成体雄の第3顎脚指節は前節 (先端部の毛の房は痕跡的) とほぼ同長である。Thelycum (雌の外部生殖器) の anterior plate はよく発達し, やゝ三角形を呈する。

また, 他の3近縁種 (*P. indicus*, *P. merguiensis*, *P. penicillatus*) との相異点も挙げ, 新種の特徴を示した。

種名は, インド中央海洋水産研究所所長で, エビ類研究者でもある F. G. SILAS 博士をたたえて, *Penaeus silasi* と命名された。標本はインド中央海洋水産研究所に, 一部東南アジア漁業開発センター養殖部局に保管されている。